

LISTING OF THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method of catalyzing an enantioselective oxidation reaction of an oxidizable, chiral organic compound composed of a racemic mixture of a first enantiomer and a second enantiomer, comprising:

a) contacting the organic compound with:

i) an oxidizing agent, and

ii) a catalyst comprising a ~~metal~~ palladium composition and a selected enantiomer of a chiral ligand, ~~wherein the metal is selected from the group consisting of Group 8, Group 9 and Group 10 of the Periodic Table of the Elements and the chiral ligand comprises at least one chiral atom and~~ containing two or more tertiary amines nitrogen atoms that are separated by two or more linking atoms; ~~and, thereby~~

b) ~~producing an oxidized organic compound and a single selectively oxidizing the first enantiomer of the organic compound so as to produce (i) an oxidized organic compound and (ii) a mixture of the first and second enantiomers in which the second enantiomer represents at least 50% of the mixture.~~

2. (original) The method of Claim 1 wherein the organic compound is selected from the group consisting of alcohols, thiols, amines and phosphines.

3. (original) The method of Claim 1 wherein the oxidizing agent is selected from the group consisting of molecular oxygen, benzoquinone, Cu (I) salts, and Cu (II) salts.

4. (original) The method of Claim 3 wherein the oxidizing agent is molecular oxygen.

5. (original) The method of Claim 1 wherein the oxidizing agent is used in a stoichiometric amount.

6. (currently amended) The method of Claim 1 ~~which is~~ wherein said contacting is conducted in an organic solvent ~~selected from the group consisting of toluene, *tert*-amyl alcohol, water, CHCl₃, methylene chloride, 1,2-dichloroethane, and benzene.~~

7. (canceled)

8. (currently amended) The method of Claim ~~7~~ 1 wherein the ~~metal~~ palladium composition is a palladium (II) complex.

9. (original) The method of Claim 8 wherein the palladium (II) complex is selected from the group consisting of Pd(OAc)₂, Pd₂(dibenzylideneacetone)₃, PdCl₂, Pd(CH₃CN₂)Cl₂, Pd(PhCN₂)Cl₂, [(allyl)PdCl]₂, PdCl₂ (cyclooctadiene), Pd(OCOCF₃), and Pd(norbornadiene)Cl₂.

10. (canceled)

11. (canceled)

12. (currently amended) The method of Claim ~~11~~ 1 where the ~~percentage of second~~ enantiomer ~~is greater than~~ represents at least 60% of the mixture.

13. (currently amended) The method of Claim 12 where the ~~percentage of second~~ enantiomer ~~is greater than~~ represents at least 90% of the mixture.

14. (canceled)

15. (canceled)

16. (canceled)

17. (currently amended) The method of Claim ~~16~~1 wherein the organic compound is a ~~chiral~~ secondary alcohol.

18. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is an enantioselective Wacker-type cyclization reaction.

19. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is an enantioselective aromatic oxidation reaction.

20. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is the enantio-group differentiation of meso diols.

21. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is an enantioselective oxidative [4+2] cycloaddition reaction.

22. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is a C-C bond forming cyclization reaction.

23. (withdrawn) The method of Claim 1 wherein the enantioselective oxidation reaction is a cyclization reaction.

24. (withdrawn) The method of Claim 23 wherein the organic compound contains an olefin tethered to a nucleophilic atom.

25. (canceled)

26. (canceled)

27. (canceled)

28. (canceled)

29. (canceled)

30. (canceled)

31. (canceled)

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35. (canceled)

36. (canceled)

37. (canceled)

38. (canceled)

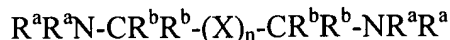
39. (canceled)

40. (canceled)

41. (canceled)

42. (canceled)

43. (currently amended) The method of Claim 1 wherein the chiral ligand has the structure[[:]]



wherein:

each ~~R^a-group~~ is independently selected from the group consisting of alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl;

X is -CR^bR^b- or a heteroatom;

n is an integer from 0-2; and

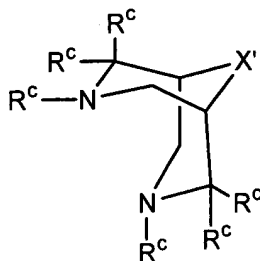
each ~~R^b-group~~ is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl; ~~and,~~

wherein two or more of the R^a and R^b ~~groups, together with the atoms to which they are attached,~~ can be taken together to form one or more cyclic structures.

44. (previously presented) The method of Claim 43 wherein n is 1 or 2.

45. (currently amended) The method of Claim 43 wherein ~~two or more of the R^a and R^b groups, together with the atoms to which they are attached, are taken together to form a four ring structure~~ the chiral ligand is tetracyclic.

46. (currently amended) The method of Claim 1 wherein the chiral ligand has the structure[[:]]



wherein; each ~~R^c-group~~ is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl, with the proviso that the R^c substituents bound to the nitrogen atoms are other than hydrogen; and X' is selected from the group

consisting of -O-, -S-, -N(R^d)-, -C(R^d)₂-, ~~-C(O)-, -C(NR^d)-, -C(OR^d)₂-, and -C(SR^d)₂-;~~ and in which each R^d ~~group~~ is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloheteroalkyl, aryl, heteroaryl and silyl; ~~and, wherein two or more of the R^c and R^d groups, together with the atoms to which they are attached, can be taken together to form one or more cyclic structures.~~

47. (currently amended) The method of Claim 46 wherein X' is ~~CR^dR^d~~ is -C(R^d)₂-; ~~and two or more of the R^e and R^d groups, together with the atoms to which they are attached, are taken together to form a four-ring structure.~~

48. (new) The method of claim 43 wherein R^a and R^b are independently selected from the group consisting of branched, unbranched, and cyclic C₁-C₂₄ alkyl optionally substituted with at least one substituent.

49. (new) The method of Claim 48, wherein the at least one substituent is selected from hydroxyl, cyano, alkoxy, =O, =S, nitro, halogen, haloalkyl, heteroalkyl, amino, and sulfhydryl.

50. (new) The method of Claim 48 wherein R^a and R^b are independently selected from the group consisting of branched, unbranched, and cyclic C₁-C₆ alkyl optionally substituted with at least one substituent.

51. (new) The method of Claim 50 wherein the at least one substituent is selected from hydroxyl, cyano, alkoxy, =O, =S, nitro, halogen, haloalkyl, heteroalkyl, amino, and sulfhydryl.

52. (new) The method of Claim 1 wherein the chiral ligand is (-)-sparteine.